AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to Figures 1B, 2A, 2B, 2C, and 2D. The drawings have been amended in the interests of clarity. In Fig. 1B, cross-hatching has been added to die 1 and die 2 to correctly indicate that this is a cut view. In Fig. 2A, die 1 has been added to this view in the interests of clarity. This element was previously only shown in the remaining views. Additionally, the direction of the arrows depicting the cut line for the remaining views was corrected to keep consistency between the drawings. In Figs. 2B, 2C, and 2D, cross-hatching has been added to die 1 and die 2 to correctly indicate that this is a cut view. Additionally, a line indicating the top of the apertures 65, 66, 67 has been shown to appropriately depict a cut view along the line designated in Fig. 2A as the cut-line.

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-8 are currently pending. Claims 1 and 8 have been amended.

Applicant's amendments and remarks after Final are appropriate under 37 C.F.R. §1.116 because they address the Office's remarks in the Final Action, and thus could not have been presented earlier. Additionally, the amendments and remarks should be entered as they place the claims in condition for allowance, or alternatively, place the case in better form for appeal.

35 U.S.C. §112 CLAIM REJECTIONS

Claim 8 has been rejected under 35 U.S.C §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has objected to the language "wherein the at least one die includes at least first and second dies" as indefinite. While Applicant disagrees that this language is indefinite, claim 8 has been amended to more clearly claim the invention. Claim 8 depends from claim 1. Claim 1 recites "at least one die formed on the die attach pad," which defines one or more dies. Claim 8, as amended, further defines this element by reciting that the at least one die "comprises at least a first die and a second die," which clearly defines that the one or more dies formed on the die attach pad as set forth in claim 1 comprises at least two dies in claim 8.

35 U.S.C. §102 CLAIM REJECTIONS

The Examiner has rejected claims 1-8 as being anticipated by U.S. Patent No. 6,143,981 to 6,143,981 to Glenn (hereinafter "Glenn").

The Claimed Invention

The claimed invention as set forth in independent claim 1 provides an improved leadframe-based chip scale package. The chip scale package in accordance with the present invention provides improved adhesion between the die attach pad and a mold compound used for encapsulation. By improving adhesion between the die attach pad and the mold compound, the performance and reliability of the chip scale package is improved. The chip scale package in accordance with the present invention improves the adhesion between the die attach pad and the mold compound by using an aperture formed in the die pad to increase the adhesion surface area of the die attach pad.

Glenn

Glenn teaches building a small chip package by using a saw to cut an encapsulated leadframe, thereby severing the disposable portions of the leadframe (col. 2, ll. 30-32). The encapsulant material is used to hold the die pad and contents to the package (col.2, ll. 46-47). The adhesion of the encapsulant material to the die is enhanced only by the reentrant portions and asperities of the side surfaces of the die attach pad and contacts. The reentrant portions and asperities of the side surfaces of the die attach pad and contacts function as encapsulant fastener or

lead locks (col. 2, ll. 47-52). The top surface of the die attach pad in Glenn is substantially planar and does not contain any apertures (see 25 in Fig. 8 and Fig. 9, col. 4, lines 2-3).

Glenn does not anticipate the claimed invention

The present invention teaches using an aperture formed in the surface of the die attach pad in areas where there are no dies attached in order to improve adhesion between the mold compound and the die attach pad. Forming an aperture in the die attach pad in areas of the die attach surface where not coupled to a die creates an increase in bonding area between the die attach pad and the mold compound relative to a device that uses a die attach pad which does not contain such an aperture. This is a key feature of the present invention, and as such, is clearly recited in claim 1.

Claim 1, as amended, recites:

A chip scale package comprising:
a leadframe including (1) a die attach pad centrally located therein, said die attach pad having a die attach surface, and (2) a plurality of wire bonding pads peripherally located therein;
at least one aperture formed in the die attach surface, wherein said aperture is open at said die attach surface;
at least one die formed on the die attach surface;
at least one bonding wire for electrically connecting the at least one die and at least one of the plurality of wire bonding pads; and
a mold compound, wherein said mold compound encapsulates the at least one die and the at least one bonding wire to form a chip scale package, and wherein the mold compound resides in the at least one aperture.

Glenn does not teach the features recited in claim 1. Glenn fails to disclose a die attach pad having at least one aperture formed in the die attach surface. The Examiner states on page 6 of the action that "Glenn specifically shows in Figs. 3-6 a die attach pad 24 with an aperture." Fig. 3 - Fig. 6 of Glenn illustrates the configuration of the side surfaces of die attach pad 24 and tabs 30.

The device taught in Glenn uses the asperities of the side surfaces of die attach pad 24 and tabs 30 to act as encapsulant fasteners (see col. 2, line 52). No aperture exists in the die attach surface (upper first surface 25) of the die attach pad 24 in Glenn. The die attach surface (upper first surface 25) of the die attach pad 24 disclosed in Glenn is substantially planar (see col. 1, line 67, col. 4, lines 2-4). Glenn clearly fails to teach using an aperture formed in the die attach surface of the die attach pad to enhance adhesion between the die attach pad and an encapsulating mold compound.

Because Glenn does not teach or suggest the features of the present invention as recited in claim 1, the Applicant respectfully requests that the rejection under 35 U.S.C . §102 be withdrawn.

CONCLUSION

Independent claims 1 is currently in condition for allowance. All remaining pending claims depend from claim 1. Thus, pending claims 1-8 are currently in condition for allowance. Applicant respectfully requests reconsideration and issuance of the subject application. If any issues remain that preclude issuance of this application, the Examiner is urged to contact the undersigned attorney.

Respectfully Submitted,

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Date

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